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MOUNTAIN PINE BEETLE INFESTATIONS IN THE NORTHERN REGION DURING 1985

Report No. 86-9

August 1986

Scott Tunnock, Mark D. McGregor,
Robert D. Oakes, Hubert E. Meyer

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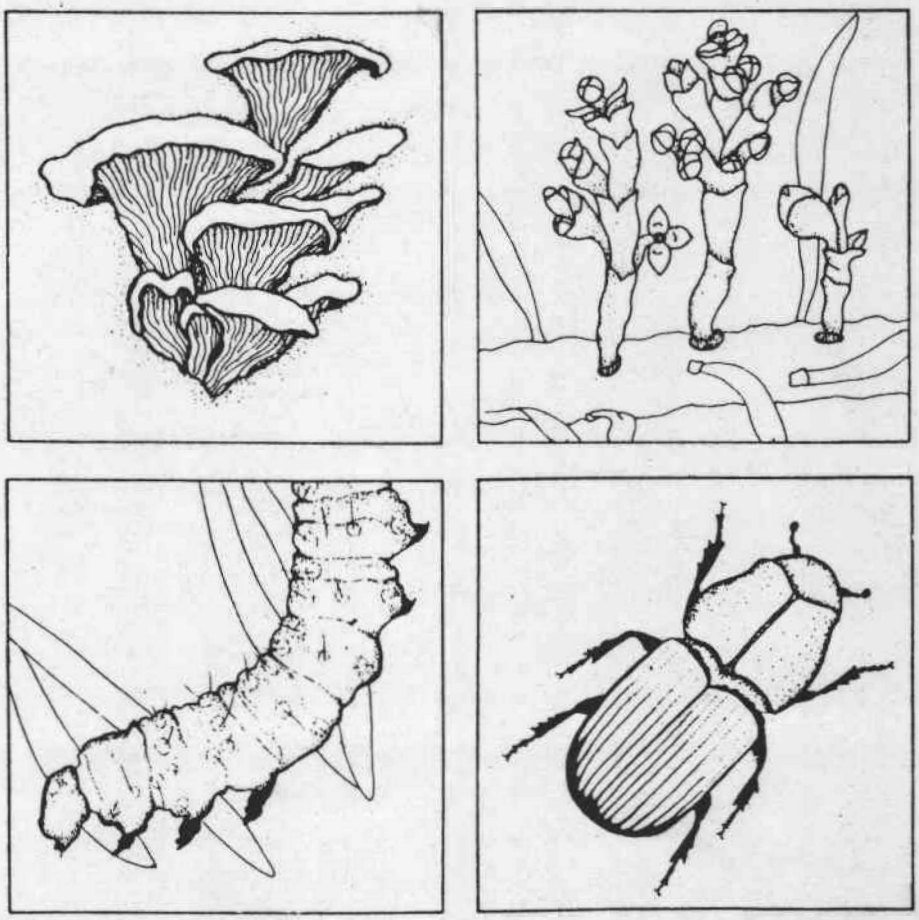

MOUNTAIN PINE BEETLE INFESTATIONS IN THE NORTHERN REGION DURING 1985

by

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MOUNTAIN PINE BEETLE INFESTATIONS IN THE NORTHERN REGION DURING 1985

The chronology of mountain pine beetle (MPB) infestations in the Northern Region has been documented by McGregor et al. (1985). This report is an update discussing changes in MPB infestations from 1984 through 1985.

Data in this report were obtained during aerial and ground surveys. Aerial surveys provided data on number of acres infested and number of "faders" (trees killed the previous year). On the ground, biological evaluations were made in selected areas on Ranger Districts to obtain data for predicting the trend of infestations in important pine stands.

Data on acres infested and trees killed per acre should not be compared to judge what the MPB is doing over an entire National Forest or Ranger District.

BEAVERHEAD NATIONAL FOREST

The outbreak on the Beaverhead reporting area decreased from 41,711 acres of pines (lodgepole [LPP] and whitebark [WBP]) in 1984 to 4,467 acres in 1985 (Table 1). Damage was confined to the Madison RD and nearby State and private lands. It was mainly on the east side of the Tobacco Root Mountains and just north of the West Fork of the Madison River (Figure 1). Mortality is expected to decrease again in 1986 due to the depletion of susceptible host trees.

Table 1.--Acres of pines infested by the mountain pine beetle on the Beaverhead National Forest, 1984 and 1985.

	Acres infested		
	1984		1985[1]
Ownership	LPP	WBP	LPP
Madison Ranger District	27,325	3,162	4,177
Sheridan Ranger District	123	--	--
State, private, other	10,624	477	290
TOTAL ACRES	38,072	3,639	4,467

[1] WBP was not separated from LPP during aerial surveys in 1985.

BITTERROOT NATIONAL FOREST

The outbreak on the Bitterroot NF decreased from 8,085 acres of pines (lodgepole and ponderosa) in 1984 to 2,400 acres in 1985 (Table 2). Main centers of ponderosa pine (PP) mortality were southwest of Darby and in the East Fork of the Bitterroot River drainage. All lodgepole pine mortality was on the West Fork Ranger District, mainly in the Selway-Bitterroot Wilderness Area (Figure 2). In 1985, the average number of PP killed per acre in the infested areas that were surveyed on the Darby Ranger District was 83.4. This is double the number killed in 1984. On the Sula Ranger District, mortality in these areas decreased from 114.4 PP per acre in 1984, to 70 in 1985 (Table 2).

Table 2.--Acres of pines infested by the mountain pine beetle and ponderosa pine trees killed per acre in infested areas on two Ranger Districts, Bitterroot National Forest, 1984 and 1985.

Ownership	Host	Acres infested 1984	Acres infested 1985	Average trees killed/acre Older	Average trees killed/acre 1984	Average trees killed/acre 1985	Total killed per acre
Darby RD	PP	1,043	925	12.4	44.5	83.4	140.3
	LPP	0	0	--	--	--	--
Sula RD	PP	357	0	20.5	114.4	70.0	204.9
	LPP	41	0	--	--	--	--
Stevensville RD	PP	0	1	--	--	--	--
	LPP	0	0	--	--	--	--
West Fork RD	PP	266	29	--	--	--	--
	LPP	3,965	779	--	--	--	--
State, private, other	PP	2,413	666	--	--	--	--
	LPP	0	0	--	--	--	--
TOTALS		8,085	2,400	--	--	--	--

CUSTER NATIONAL FOREST

Mortality in PP stands decreased throughout the Custer National Forest in 1985. Most damage was on the Sioux Ranger District in the Ekalaka Hills. One spot of WBP was infested south of Red Lodge (Table 3, Figure 3).

Table 3.--Acres of pines infested by the mountain pine beetle on the Custer National Forest, 1984 and 1985.

Ownership	Acres infested 1984 LPP	1984 PP	1984 WBP	1985 LPP	1985 PP	1985 WBP
Ashland RD	0	110	0	--	--	--
Beartooth RD	3	0	229	1	0	1
Sioux RD	1	1,048	0	0	215	0
State, private, other	205	272	352	5	264	110
Total acres	209	1,430	581	6	479	111

DEERLODGE NATIONAL FOREST

The number of acres of LPP infested by the MPB decreased from 7,049 in 1984, to 4,986 in 1985 on the Deerlodge NF (Figure 4). Most of the damage was on the Jefferson Ranger District in the Homestake Pass area where, although infested acres decreased, trees killed per acre in infested areas more than doubled (Table 4).

Table 4.--Acres of lodgepole pine infested by the mountain pine beetle, and trees killed per acre in infested areas on the Jefferson Ranger District, Deerlodge National Forest, 1984 and 1985.

Ownership	Acres infested 1984	Acres infested 1985	Average trees killed/acre Older	Average trees killed/acre 1984	Average trees killed/acre 1985	Total killed per acre
Deerlodge RD	34	0	--	--	--	--
Jefferson RD	6,329	4,943	26.9	10.8	25.7	63.4
Butte RD	71	0	--	--	--	--
Phillipsburg RD	114	20	--	--	--	--
State, private, other	501	23	--	--	--	--
TOTALS	7,049	4,986	--	--	--	--

FLATHEAD NATIONAL FOREST

Mortality in LPP stands increased from 170,124 acres in 1984, to 225,497 acres in 1985 on the Flathead NF. Increases occurred on all Ranger Districts except Spotted Bear (Table 5). The greatest increase was on the Tally Lake Ranger District west of Kalispell where 99,124 acres were infested (Figure 5). High altitude WBP stands and mature stands of western white pine (WWP) over the Flathead NF are slowly being depleted. On State and private lands, 9,001 acres of PP were infested.

An outbreak is starting to develop in the mountains on the east side of Flathead Lake south of Bigfork. Mortality will increase on the Swan Lake and Tally Lake Ranger Districts in 1986 (Table 5).

GALLATIN NATIONAL FOREST

No aerial or ground surveys were made on the Gallatin National Forest during 1985 by Forest Pest Management. During 1984, 228,255 acres of LPP and some WBP were infested by the MPB on this Forest. The outbreak has been steadily decreasing since 1981 and will probably be close to dying out in 1986.

Table 5.--Acres of pines infested by the mountain pine beetle and trees killed per acre in infested areas on the Flathead National Forest, 1984 and 1985.

Ownership	Host	Acres infested 1984	Acres infested 1985	Average trees killed per acre Older	Average trees killed per acre 1984	Average trees killed per acre 1985	Total killed per acre
Glacier View RD	LPP	676	921	--	--	--	--
	WBP	892	1,107	--	--	--	--
	WWP	269	245	--	--	--	--
Hungry Horse RD	LPP	394	1,331	--	--	--	--
	WBP	80	458	--	--	--	--
	WWP	851	1,036	--	--	--	--
Spotted Bear RD	LPP	364	292	--	--	--	--
	WBP	13	70	--	--	--	--
	WWP	113	110	--	--	--	--
Swan Lake RD	LPP	17,681	23,279	27.8	19.0	48.9	95.7
	WBP	21	683	--	--	--	--
	WWP	0	183	--	--	--	--
	PP	12	62	--	--	--	--
Tally Lake RD	LPP	56,976	99,124	16.2	33.5	110.4	160.1
	WWP	1	0	--	--	--	--
	PP	3	0	--	--	--	--
State, private other	LPP	94,033	100,550	--	--	--	--
	WBP	0	1	--	--	--	--
	WWP	13	316	--	--	--	--
	PP	13,567	9,001	--	--	--	--
TOTALS		185,959	238,769	--	--	--	--

HELENA NATIONAL FOREST

Outbreaks in LPP stands decreased from 2,830 acres in 1984, to 1,531 acres in 1985, but increased in PP stands from 2 acres in 1984, to 792 acres in 1985 (Table 6). Most of the damage in LPP stands is on the Townsend Ranger District in the Deep Creek area (Figure 6A). An evaluation in Deep Creek to determine trees killed per acre in infested areas showed 27.8 old killed trees, 21.2 trees killed in 1984, and 24.3 killed in 1985 which totaled 73.3 trees killed per acre. This indicates a slight increase in damage during 1985. Damage in PP stands continued on State and private lands in the Wolf Creek area and increased north of Fort Logan, west of the Smith River (Figure 6B).

Table 6.--Acres of pines infested by the mountain pine beetle on the Helena National Forest, 1984 and 1985.

Ownership	Acres infested 1984 LPP	1984 PP	1985 LPP	1985 PP	1985 WBP
Canyon Ferry RD	131	0	0	39	0
Townsend RD	1,858	0	1,335	0	0
Helena RD	0	2	2	169	0
Lincoln RD	0	0	5	3	48
State, private, other	841	0	189	581	0
TOTAL ACRES	2,830	2	1,531	792	48

IDAHO PANHANDLE NATIONAL FORESTS

Stands of mature WWP continued to be depleted by the MPB throughout northern Idaho. Damage was heaviest on the Bonners Ferry Ranger District and north of Priest Lake (Table 7). It appears that an outbreak in LPP stands was started when beetles emerged from infested logs stored at a sawmill at Moyie River. Efforts are being made to contain this infestation.

Table 7.--Acres of pines infested by the mountain pine beetle on the Idaho Panhandle National Forests during 1985.

Ownership	Acres infested WWP	PP	LPP
St. Maries RD	1	0	0
Bonners Ferry RD	710	11	41
Priest Lake RD	64	0	0
State, private, other	104	76	326
TOTAL ACRES	879	87	367

KOOTENAI NATIONAL FOREST

The amount of acreage on the Kootenai NF infested by the MPB decreased slightly from 1984 to 1985 (Table 8). In LPP stands it decreased from 597,477 acres in 1984, to 554,979 acres in 1985. In adjacent PP stands infestation increased from 9,927 acres in 1984, to 21,219 acres in 1985. Most of the increased killing of PP occurred along the Fisher River. An epidemic is building rapidly on the Fisher River RD on the east side of Lake Koocanusa near Richards Mountain. From 1984 to 1985, there was an average buildup ratio of 1:7 infested lodgepole pine trees per acre. In one stand there were 381 trees/acre that were killed in 1985. The outbreak is decreasing in the Yaak River area but will continue to increase in the southeast quarter of the Kootenai National Forest (Table 8, Figure 7). In 1985, almost 2 million killed pine trees were recorded.

Table 8.--Acres of pines infested by the mountain pine beetle and lodgepole pine trees killed per acre in infested areas on five Ranger Districts, Kootenai National Forest, 1984 and 1985.

Ownership	Host	Acres infested 1984	Acres infested 1985	Average trees killed/acre Older	Average trees killed/acre 1984	Average trees killed/acre 1985	Total killed per acre
Cabinet RD	LPP	2,324	4,888	--	--	--	--
	WWP	1	406	--	--	--	--
	PP	3	2	--	--	--	--
Fisher River RD	LPP	177,617	174,405	58.9	55.0	63.6	177.5
	WWP	10	3	--	--	--	--
	PP	2,949	9,784	--	--	--	--
Fortine RD	LPP	38,691	19,291	5.6	25.9	51.7	83.2
	WBP	210	0	--	--	--	--
	WWP	151	0	--	--	--	--
	PP	23	191	--	--	--	--
Libby RD	LPP	16,898	53,070	18.5	31.3	55.8	105.6
	WBP	3	202	--	--	--	--
	WWP	408	94	--	--	--	--
	PP	366	1,846	--	--	--	--
Rexford RD	LPP	29,758	28,081	33.2	36.1	28.4	97.7
	WBP	90	0	--	--	--	--
	WWP	25	24	--	--	--	--
	PP	12	344	--	--	--	--
Troy RD	LPP	299	1,433	--	--	--	--
	WWP	87	320	--	--	--	--
	PP	8	159	--	--	--	--
Yaak RD	LPP	107,449	82,230	38.6	16.0	5.7	60.3
	WWP	22	123	--	--	--	--
State, private, other	LPP	224,511	191,581	--	--	--	--
	WBP	0	60	--	--	--	--
	WWP	11	9	--	--	--	--
	PP	6,566	8,893	--	--	--	--
TOTALS		608,492	577,439	--	--	--	--

LEWIS AND CLARK NATIONAL FOREST

Only 68 acres of LPP trees were infested on the Lewis and Clark NF during 1985 (Table 9). However, in PP stands, damage increased from 1,299 acres in 1984, to 26,630 acres in 1985. Most of this mortality was north and south of Lewistown in the Judith and Snowy Mountains (Figure 8). Chronic damage persists in PP stands in the Upper Judith River drainage. All areas evaluated, except some spots in the Snowy Mountains, showed that damage decreased in PP stands from 1984 to 1985 (Table 10).

Table 9.--Acres of pines infested by the mountain pine beetle on the Lewis and Clark National Forest, 1984 and 1985.

	Acres infested			
	1984		1985	
Ownership	LPP	PP	LPP	PP
Kings Hill RD	5	80	66	575
Judith RD	100	684	0	1,188
Musselshell RD	81	100	1	2,744
State, private, other	183	435	1	22,123
TOTAL ACRES	369	1,299	68	26,630

Table 10.--Ponderosa pines killed per acre in infested areas on the Lewis and Clark National Forest, 1984 and 1985.

	Average trees killed per acre			Total killed
Area	Old	1984	1985	per acre
Mussellshell RD	21.5	62.5	30.6	114.6
Belt RD	3.5	26.9	21.8	52.2
N. side Big Snowies	23.5	173.4	0	196.9
Snowies	7.3	0	17.6	24.9

LOLO NATIONAL FOREST

The number of acres of pines infested by the MPB decreased from 58,412 in 1984, to 36,621 in 1985 (Table 11). Lodgepole pine stands are being depleted the most but damage decreased from 48,224 acres in 1984, to 30,582 acres in 1985. The most susceptible LPP stands being infested are on the Plains Ranger District and in the Thompson River complex (Figure 9A). In 1985, 4,923 acres of PP were infested. The greatest amount of this damage occurred in the Garnet Mountains and in the Blackfoot River drainage (Figure 9B). Infestations seem to be decreasing in LPP stands on the Ninemile and Plains Ranger Districts, but may increase on the Superior Ranger District (Table 11).

Table 11.--Acres of pines infested by the mountain pine beetle and trees killed per infested acre on the Lolo National Forest, 1984 and 1985.

Ownership	Host	Acres infested 1984	Acres infested 1985	Average trees killed/acre Older	Average trees killed/acre 1984	Average trees killed/acre 1985	Total killed per acre
Missoula RD	LPP	202	0	--	--	--	--
	PP	92	71	--	--	--	--
Ninemile RD	LPP	2,088	4,225	0	40.0	29.1	69.1
	PP	393	313	--	--	--	--
	WBP	80	0	--	--	--	--
	WWP	327	0	--	--	--	--
Plains RD	LPP	27,665	13,102	64.2	75.7	47.7	187.6
	PP	627	451	--	--	--	--
	WBP	118	0	--	--	--	--
Superior RD	LPP	2,089	374	36.4	5.4	22.2	64.0
	PP	521	371	--	--	--	--
	WWP	20	0	--	--	--	--
Thompson Falls RD	LPP	7,315	2,205	--	--	--	--
	PP	487	40	--	--	--	--
	WBP	2,111	335	--	--	--	--
	WWP	76	1	--	--	--	--
Seeley Lake RD	LPP	0	230	--	--	--	--
	PP	0	1	--	--	--	--
	WBP	0	779	--	--	--	--
Garnet Mtns.	LPP	12	389	--	--	--	--
	PP	3,344	2,962	--	--	--	--
State, private, other	LPP	8,853	10,057	--	--	--	--
	PP	1,897	714	--	--	--	--
	WBP	10	1	--	--	--	--
	WWP	85	0	--	--	--	--
TOTAL ACRES		58,412	36,621	--	--	--	--

NEZPERCE NATIONAL FOREST

Infestations in LPP stands decreased from 18,042 acres in 1984, to 4,792 acres in 1985 (Table 12). Damage in PP stands is still a minor problem. Evaluations on the Red River and Elk City Ranger Districts indicate the outbreak is starting to increase again in their LPP stands (Table 12). These two Districts contain the most MPB damage on the Nezperce National Forest (Figure 10).

Table 12.--Acres of pines infested by the mountain pine beetle and lodgepole pine trees killed per acre in infested areas on two Ranger Districts, Nezperce National Forest, 1984 and 1985.

Ownership	Host	Acres infested 1984	Acres infested 1985	Average trees killed/acre Older	Average trees killed/acre 1984	Average trees killed/acre 1985	Total killed per acre
Slate Cr. RD	LPP	0	2	--	--	--	--
	PP	0	26	--	--	--	--
Red River RD	LPP	13,899	4,257	9.6	0.8	4.1	14.5
	PP	0	2	--	--	--	--
Elk City RD	LPP	3,152	23	5.3	2.4	3.8	11.5
	PP	0	2	--	--	--	--
State, private, other	LPP	991	510	--	--	--	--
	PP	0	3	--	--	--	--
TOTAL ACRES		18,042	4,825	--	--	--	--

GLACIER NATIONAL PARK

The MPB has just about killed all the high-hazard stands of pines in Glacier National Park. In 1985, only 12,412 acres of LPP were infested (Table 13). Most of the damage occurred on the east side from St. Mary's Lake north to the Canadian border, and along the middle fork of the Flathead River (Figure 11).

Damage is still chronic in mature WWP stands on the west side along drainages flowing into the middle fork of the Flathead River.

Table 13.--Acres of pines infested by the mountain pine beetle in Glacier National Park, 1984 and 1985.

Year	Acres infested LPP	WBP	PP	WWP	Totals
1984	17,620	5	0	520	18,145
1985	12,412	157	1	58	12,628

YELLOWSTONE NATIONAL PARK

The outbreak in Yellowstone National Park has just about ended. The number of acres of LPP/WBP type infested decreased from 106,498 in 1984, to 6,929 in 1985. Most of this damage is in the Mammoth Hot Springs area and to the south (Figure 12).

BLACKFEET INDIAN RESERVATION

The outbreak in LPP stands on the Blackfeet Indian Reservation has decreased from 8,721 acres in 1984, to 4,188 acres in 1985. Most of the damage is east of the Belly River adjacent to Glacier National Park (Figure 11). In 1985, 10,426 LPP faders were detected on the Reservation.

CROW INDIAN RESERVATION

The outbreak in PP stands within the Rosebud Mountains east of Lodge Grass increased from 1,247 acres in 1984, to 5,717 acres in 1985 (Figure 13). An evaluation to determine trees killed per acre showed there was an average of 21.9 older killed trees, 22.2 trees killed in 1984, and 28.3 killed in 1985 which totaled 72.4 trees killed per acre. This indicates the infestation increased during 1985.

NORTHERN CHEYENNE INDIAN RESERVATION

Damage in PP stands east of Lame Deer decreased from 3,313 acres in 1984, to 2,166 acres in 1985. Only 644 killed trees were detected during 1985 (Figure 14).

FLATHEAD INDIAN RESERVATION

Damage in pine stands increased from 2,138 acres in 1984, to 3,887 acres in 1985 (Table 14). Most tree killing in LPP stands is occurring in the northwestern corner of the Reservation (Figure 15A). Ponderosa pine mortality is abundant there also, but is occurring throughout the Reservation (Figure 15B). In 1985, 908 LPP and 1,511 PP faders were detected on the Reservation. An evaluation in Mill Creek showed that 103 LPP per acre infested were killed in 1984, but none was killed in 1985. This indicates damage is decreasing in this area.

Table 14.--Acres of pines infested by the mountain pine beetle on the Flathead Indian Reservation, 1984 and 1985.

	Acres infested			
Year	LPP	PP	WBP	Totals
1984	915	1,223	0	2,138
1985	1,923	1,825	139	3,887

FORT BELKNAP INDIAN RESERVATION/BUREAU OF LAND MANAGEMENT

The outbreak in PP stands in the Little Rocky Mountains decreased from 1,333 acres in 1984, to 925 acres in 1985. Most damage is on Bureau of Land Management (BLM) lands northeast of Zortman (Figure 16). An evaluation on BLM lands showed there were 100 trees killed per acre in infested areas in 1984, and 40 killed in 1985. This indicates the infestation is decreasing in that area. In 1985, 1,172 PP faders were detected in the Little Rocky Mountain area.

ROCKY BOY'S INDIAN RESERVATION

This Reservation was not surveyed during 1985. However, the MPB is at a low level in PP stands and some stands of LPP.

STILLWATER STATE FOREST

This Forest was not surveyed during 1985. In 1984, 1,336 acres of LPP type were infested. Damage probably persisted in 1985.

SWAN RIVER STATE FOREST

The MPB is at a low level in pine stands on this Forest. In 1985, 28 acres of WWP, 1 acre of PP, 12 acres of LPP, and 6 acres of WBP were infested. This amounted to 53 pine faders. This was a great decrease in damage over 1984 when 2,730 acres of LPP were infested on private lands in this area.

THOMPSON RIVER STATE FOREST

Damage in LPP and PP stands decreased in this area during 1985 (Figure 9). On State lands, 173 acres of PP were infested and 659 acres of LPP were infested. This amounted to 1,747 pine faders in 1985. No data were computed for damage on private lands within the State Forest.

CRAIG MOUNTAINS, IDAHO

The outbreak persists in the Craig Mountains. Acres infested were not computed for 1985, but in 1984, 6,257 acres of LPP were infested along with 460 acres of adjacent PP. A 1985 evaluation to determine average trees killed per acre in LPP stands showed 63.6 old killed trees, 77.6 trees killed in 1984, and 33.6 trees killed in 1985 which equaled 174.8 killed trees per acre infested in this unit. This data indicates the outbreak is decreasing in LPP stands in the Craig Mountains.

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McGregor, M. D. et al. 1985. Status of mountain pine beetle infestations, Northern Region 1984. USDA For. Serv., Coop. For. & Pest Mgmt., Missoula, MT. Report 85-25, 57 pp. illus.

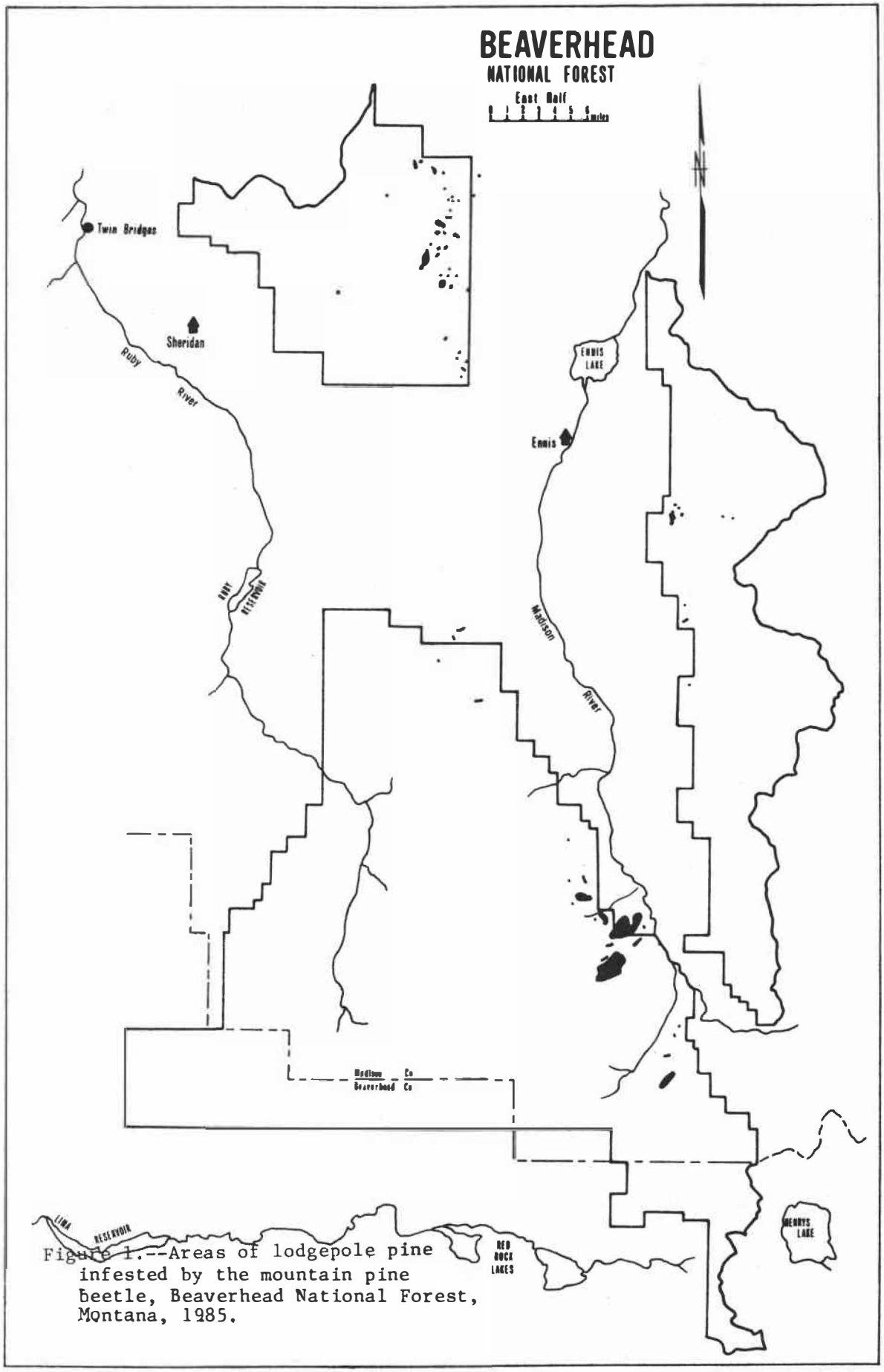
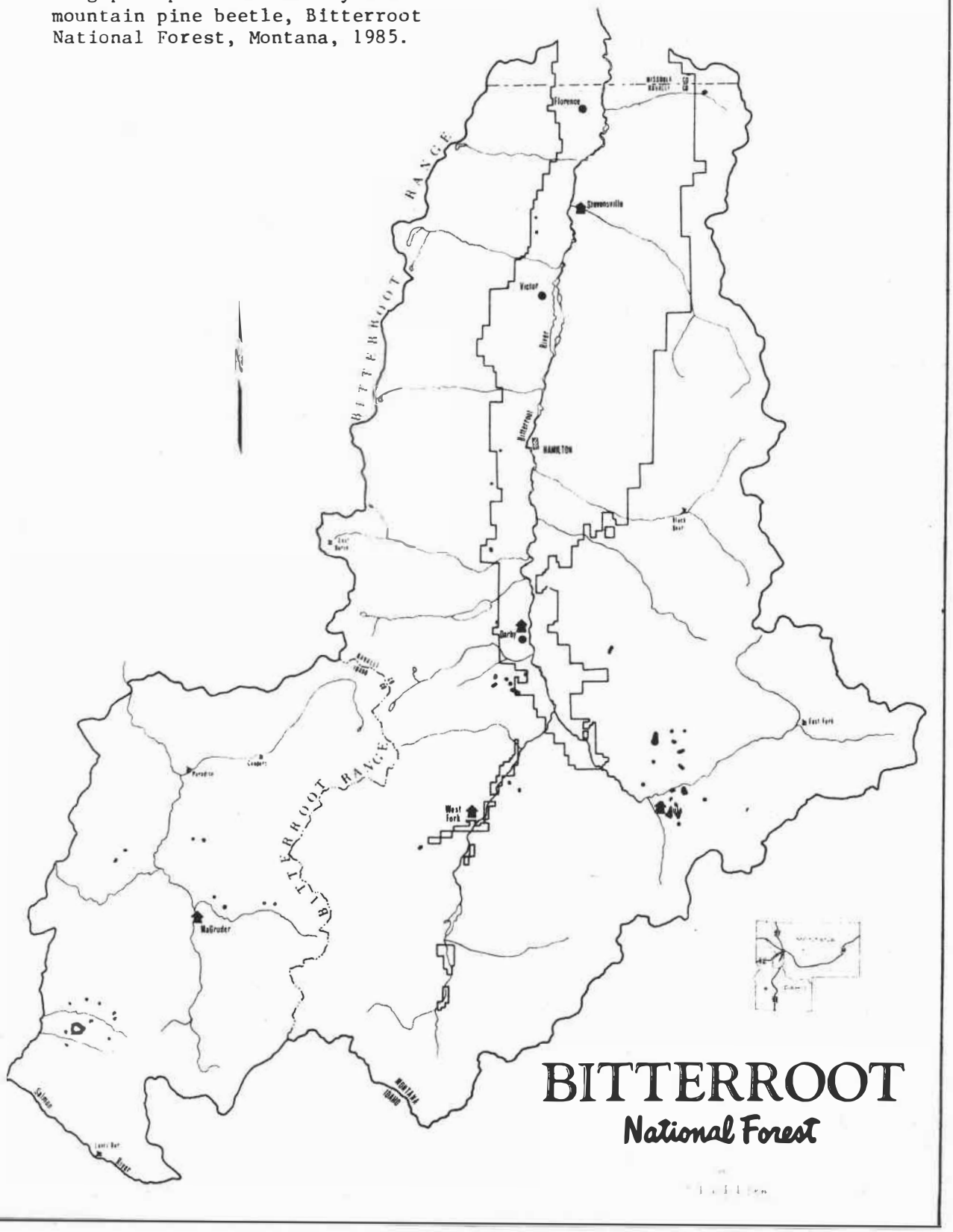


Figure 1.--Areas of lodgepole pine infested by the mountain pine beetle, Beaverhead National Forest, Montana, 1985.

Figure 2.--Areas of ponderosa and lodgepole pine infested by the mountain pine beetle, Bitterroot National Forest, Montana, 1985.



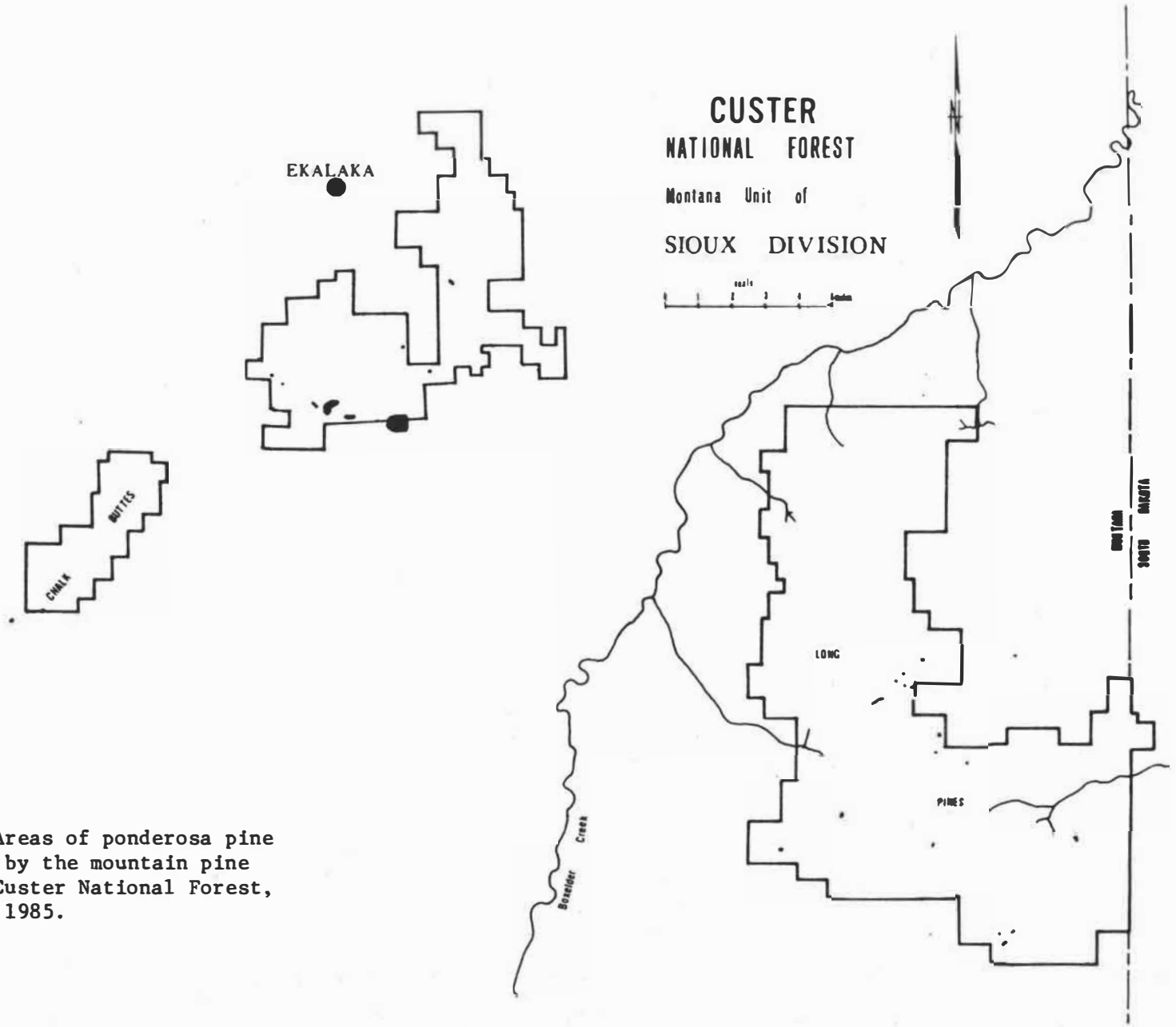


Figure 3.--Areas of ponderosa pine infested by the mountain pine beetle, Custer National Forest, Montana, 1985.

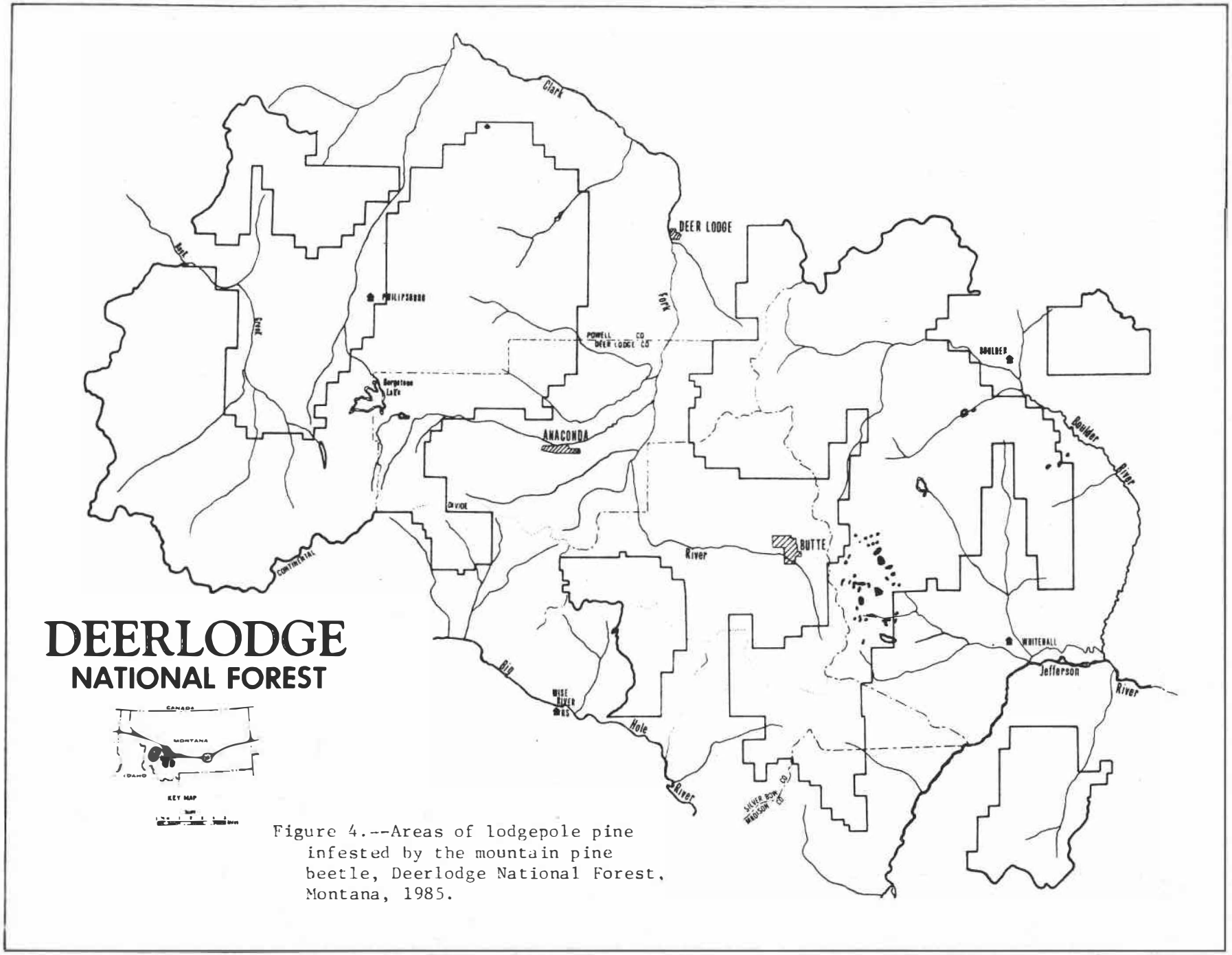


Figure 4.--Areas of lodgepole pine infested by the mountain pine beetle, Deerlodge National Forest, Montana, 1985.

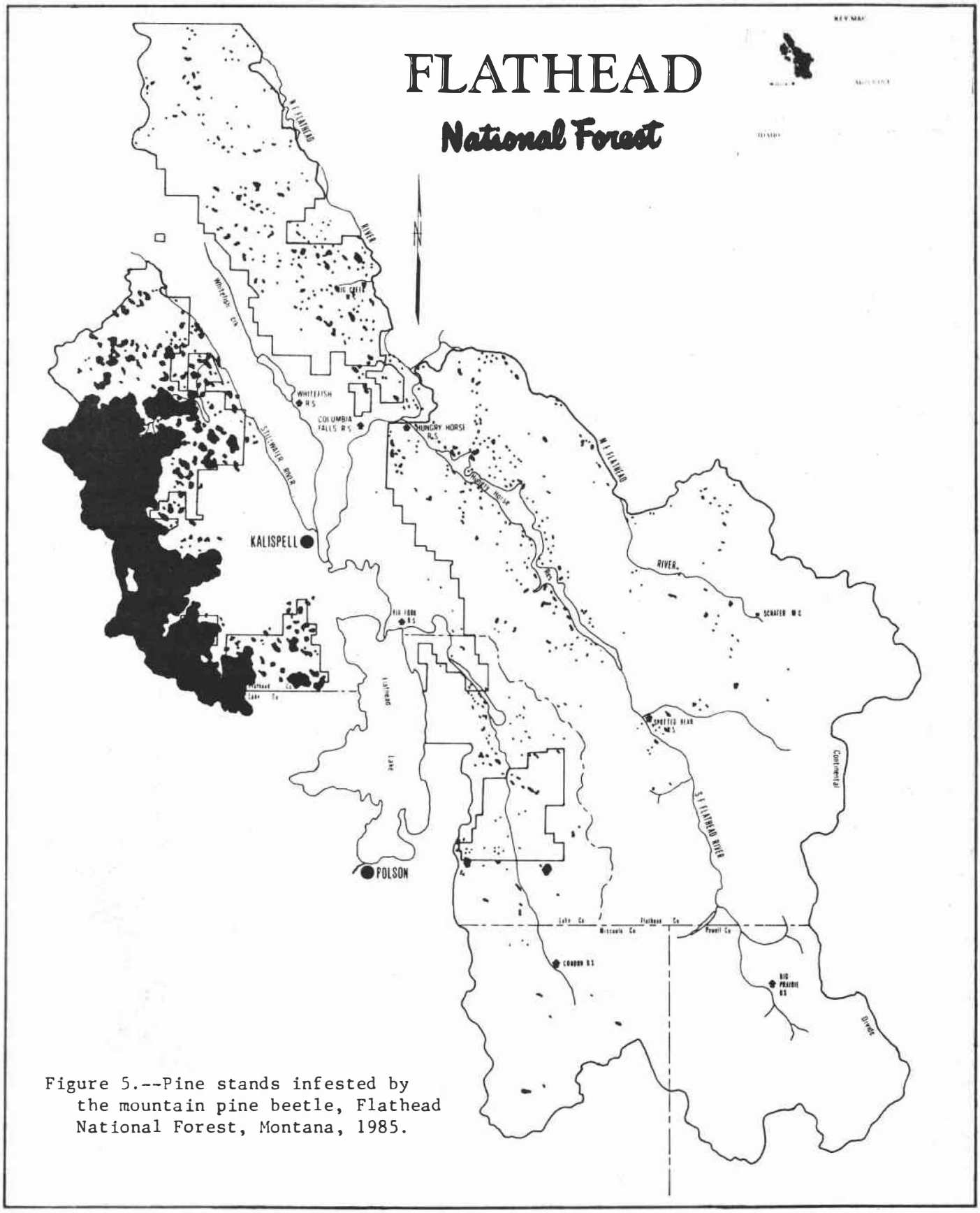


Figure 5.--Pine stands infested by the mountain pine beetle, Flathead National Forest, Montana, 1985.

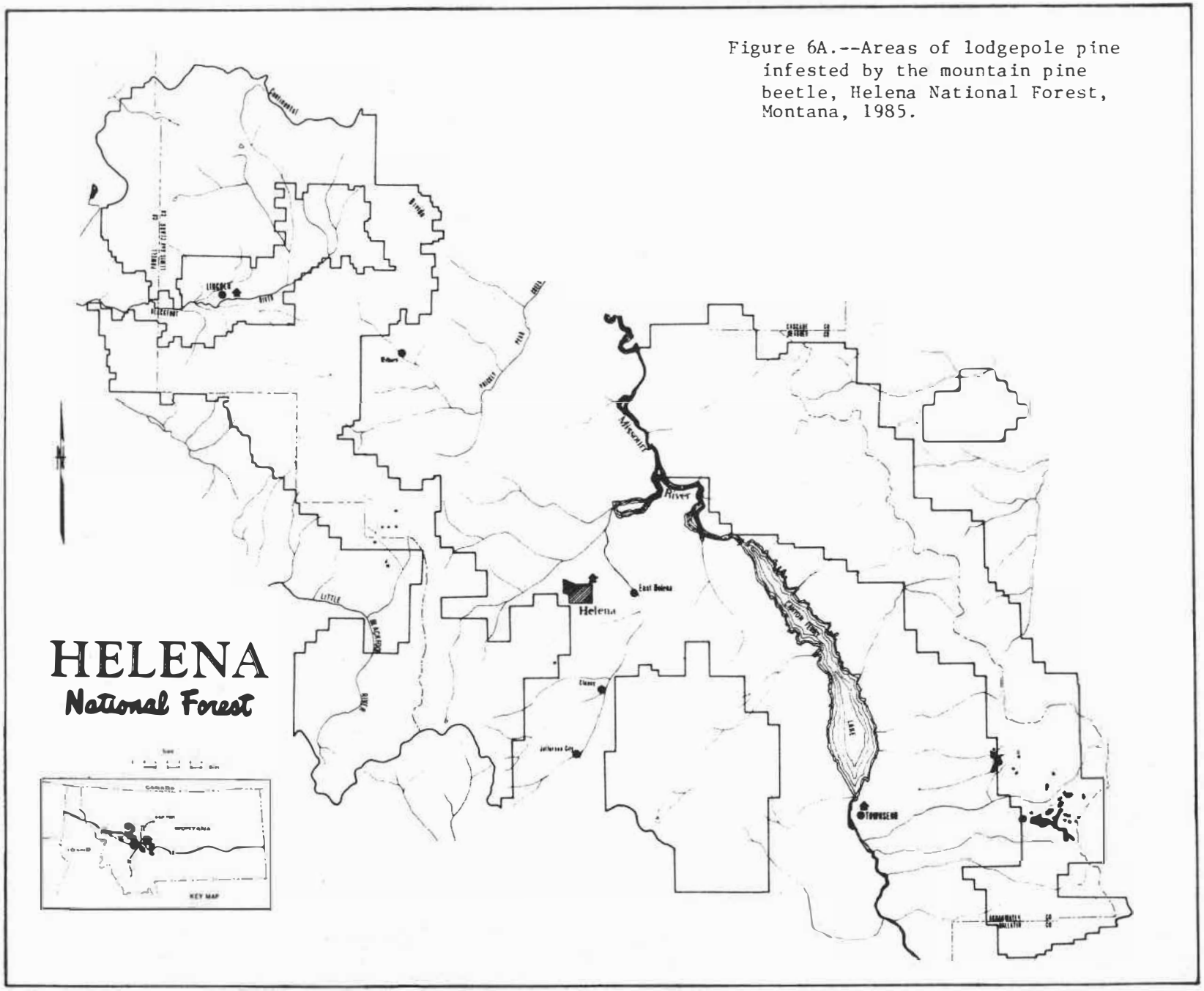


Figure 6A.--Areas of lodgepole pine infested by the mountain pine beetle, Helena National Forest, Montana, 1985.

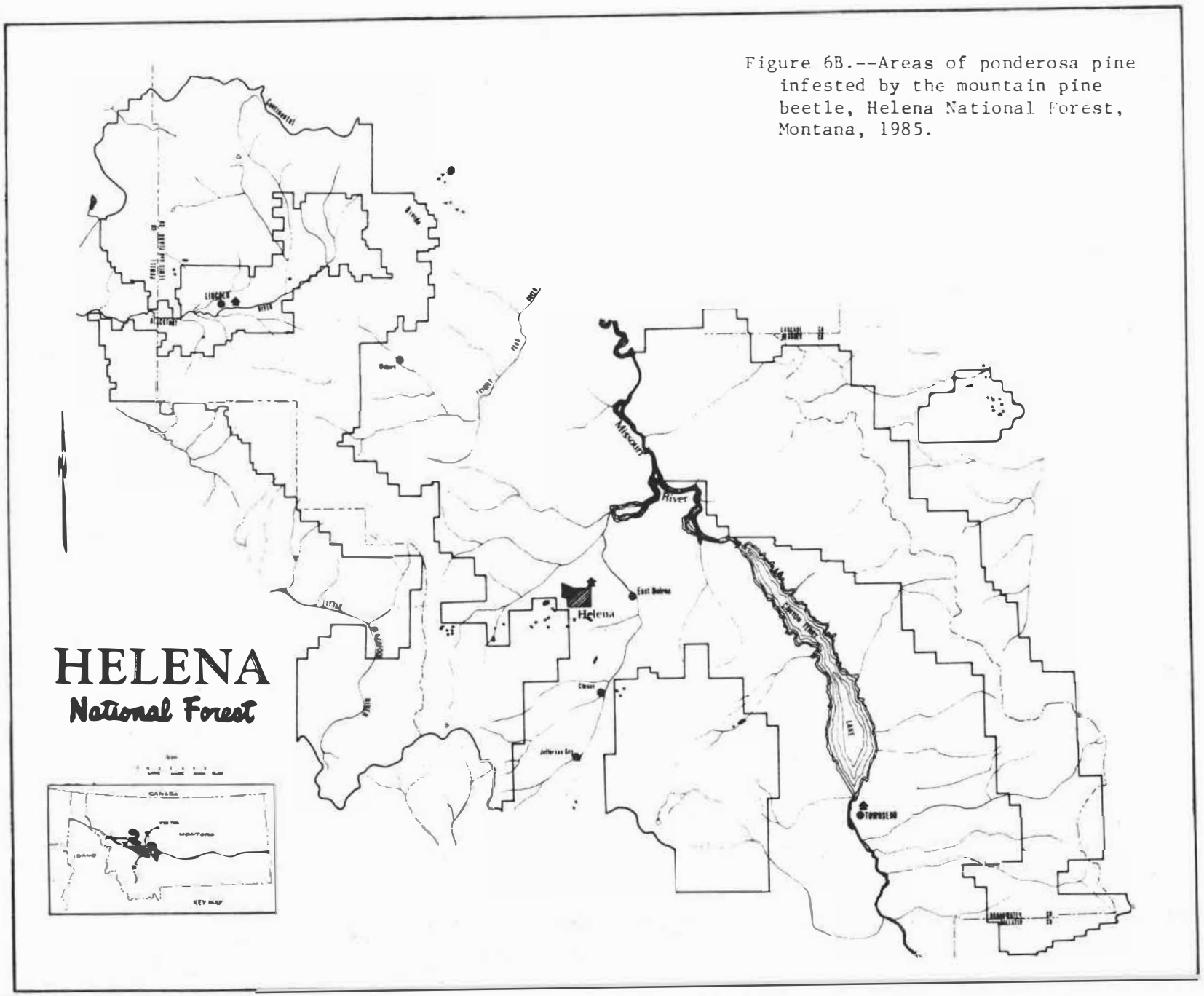
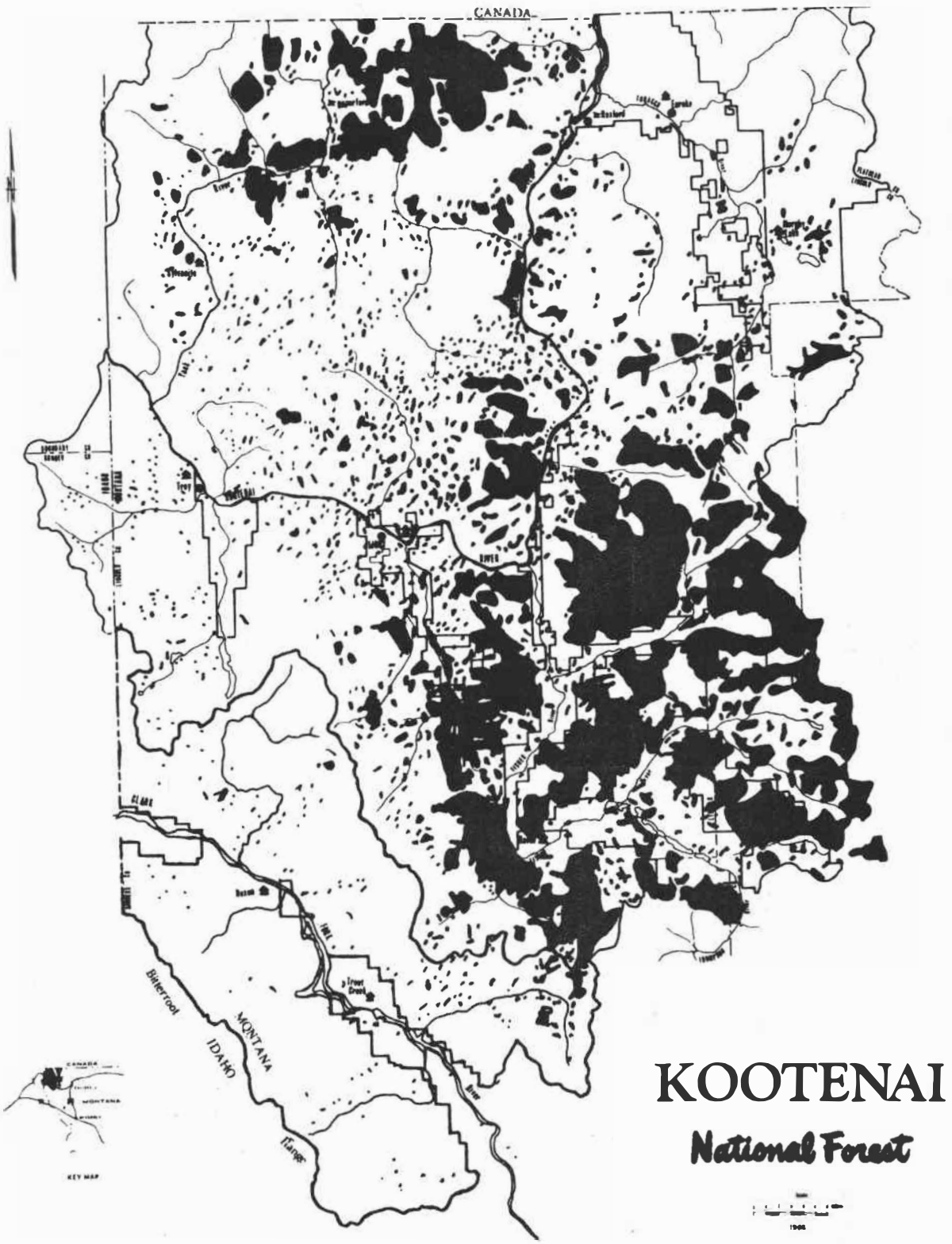


Figure 6B.--Areas of ponderosa pine infested by the mountain pine beetle, Helena National Forest, Montana, 1985.

Figure 7.--Pine stands infested by the mountain pine beetle, Kootenai National Forest, Montana, 1985.



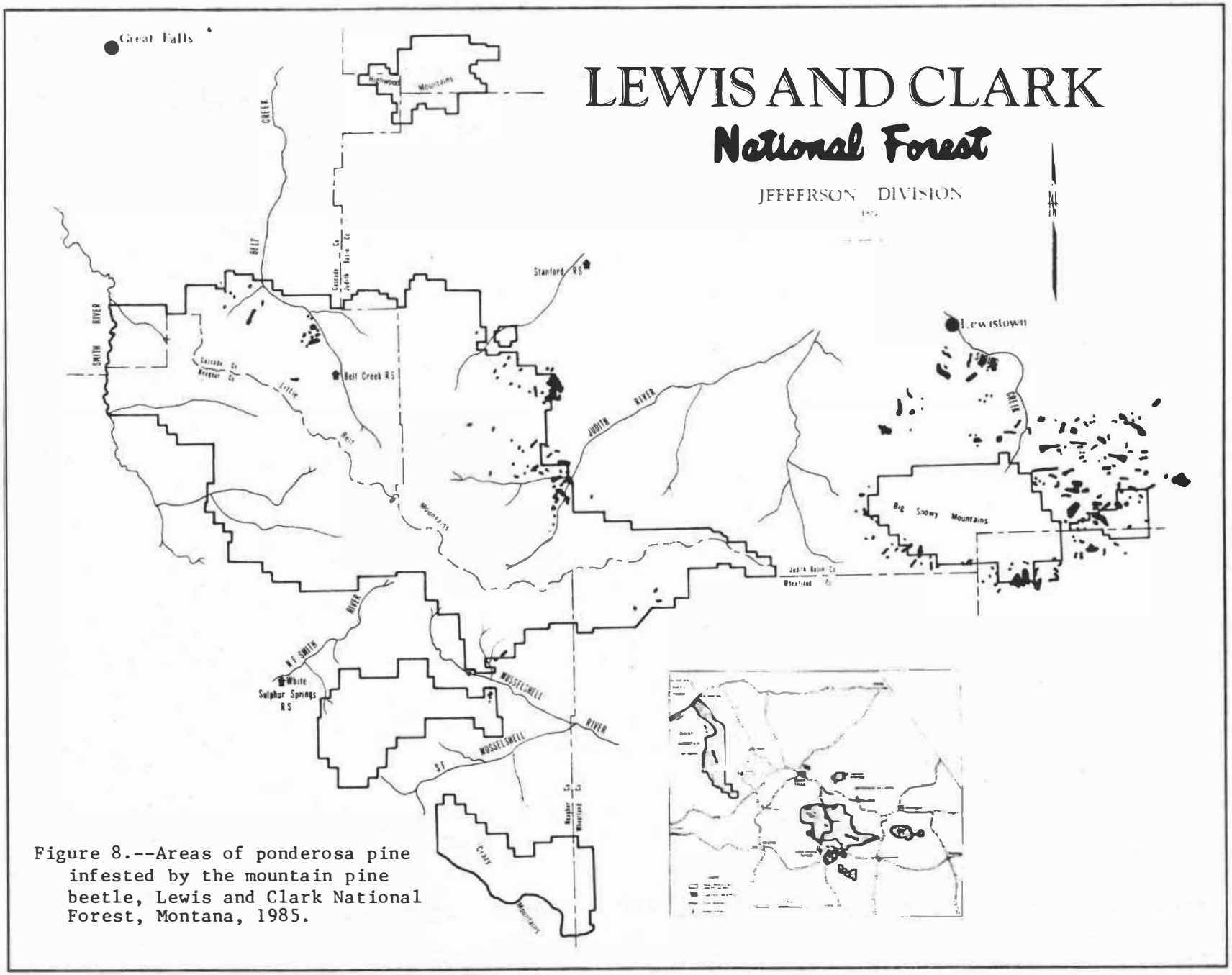


Figure 8.--Areas of ponderosa pine infested by the mountain pine beetle, Lewis and Clark National Forest, Montana, 1985.

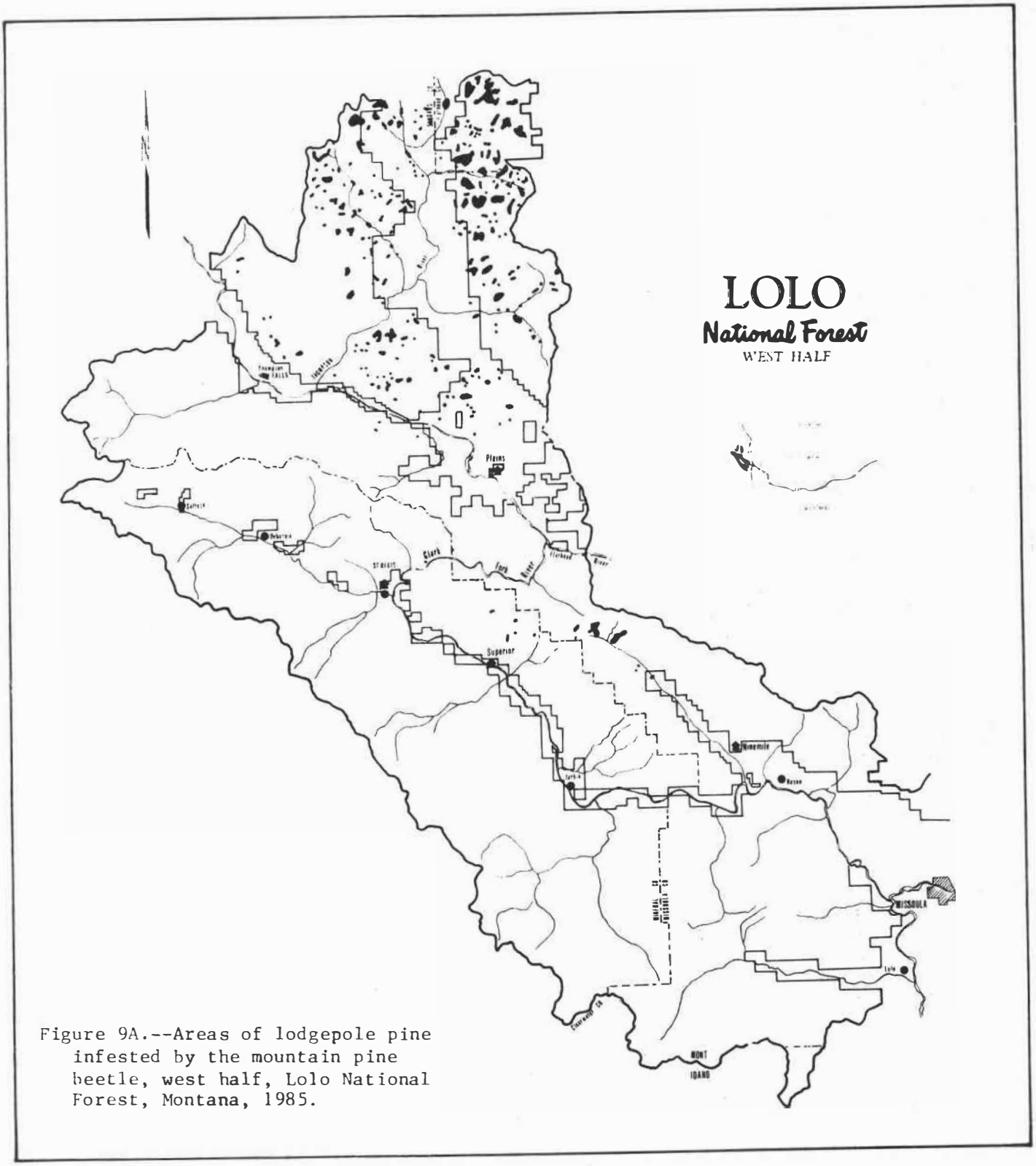
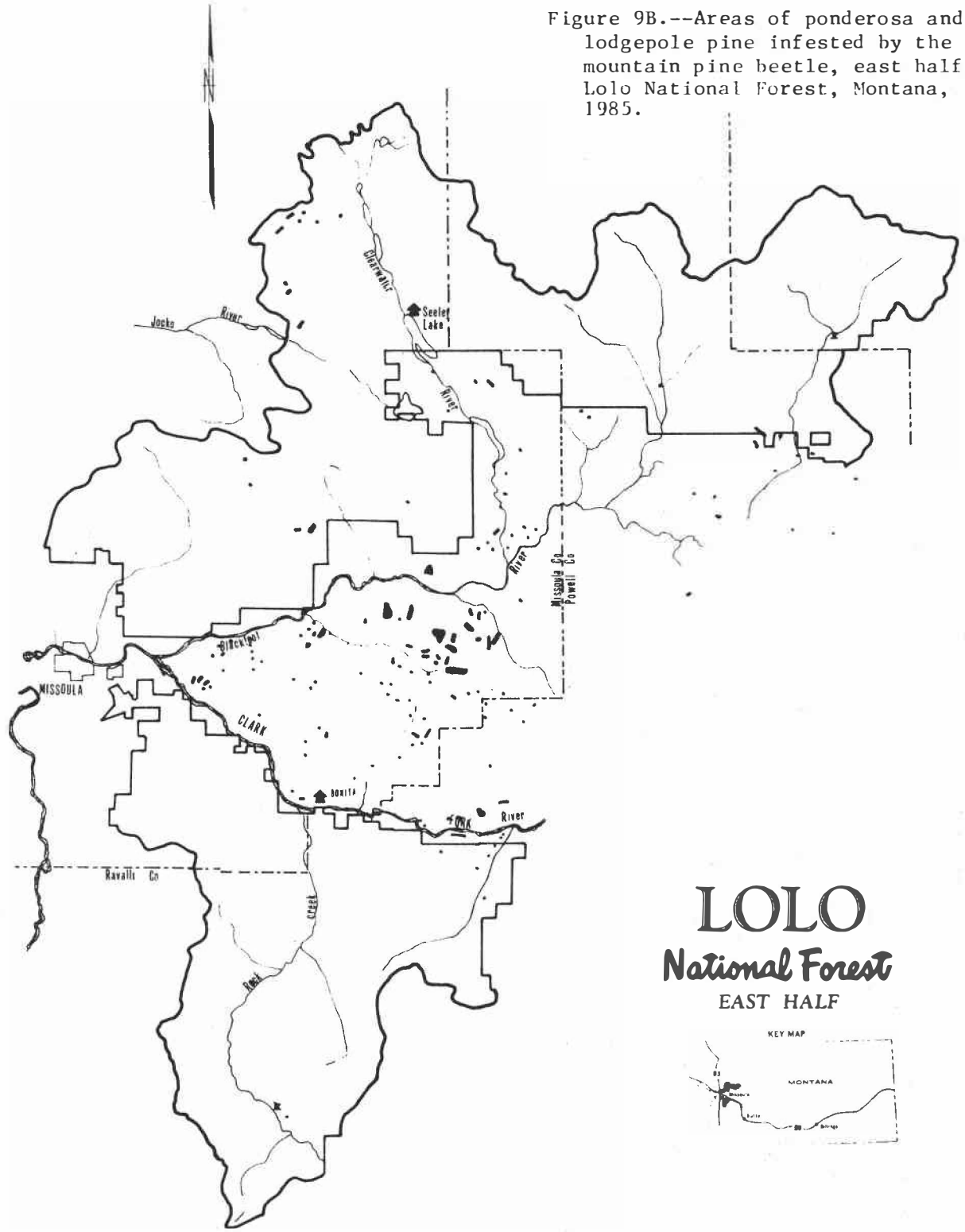

LOLO
National Forest
WEST HALF
Plains
Superior
Clark Fork River
Thompson Falls
Libby
Eureka
Kalispell
St Regis
Superior
Ranger Station
Ranger Station
Ranger Station

Figure 9B.--Areas of ponderosa and lodgepole pine infested by the mountain pine beetle, east half, Lolo National Forest, Montana, 1985.



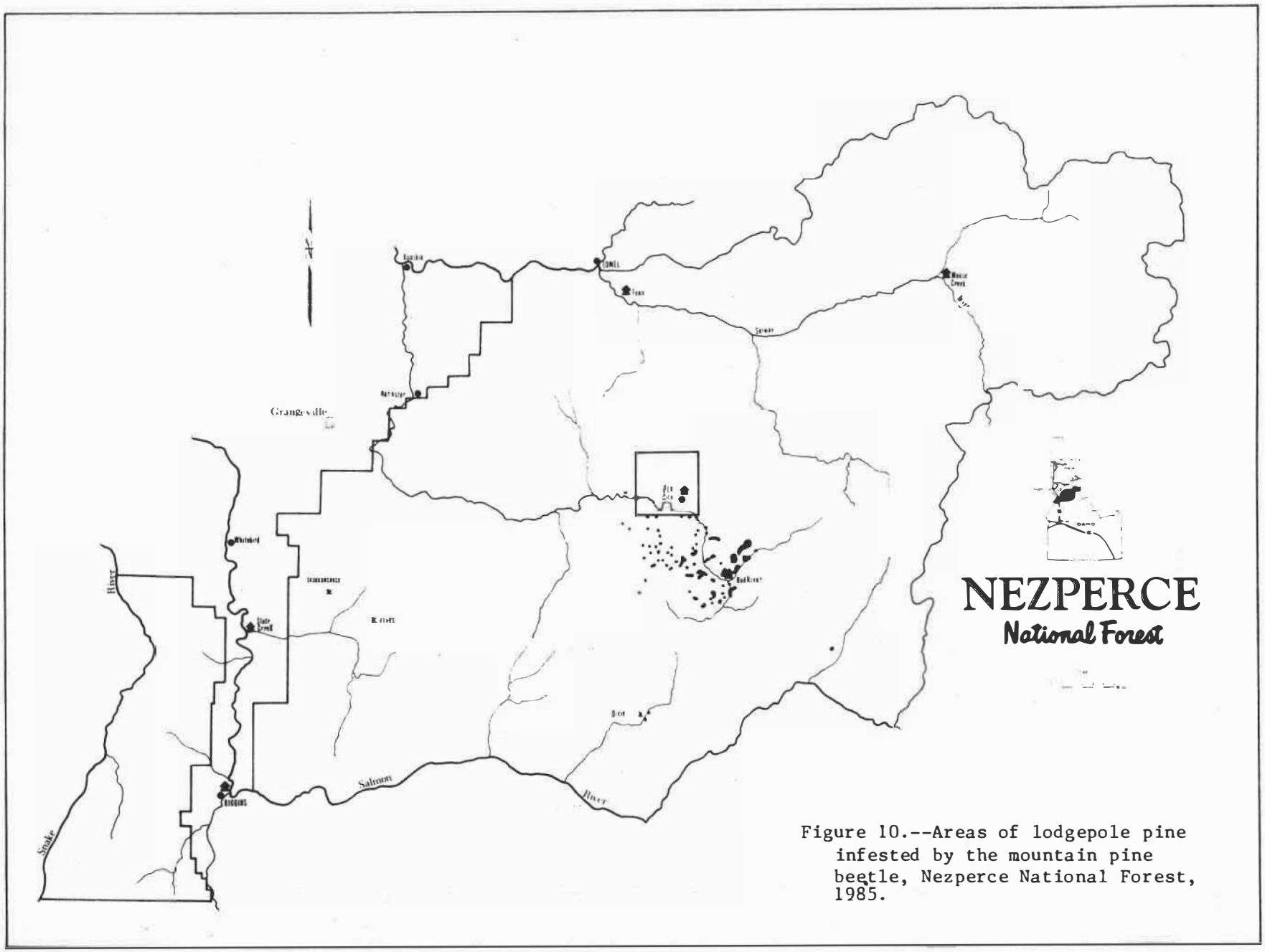
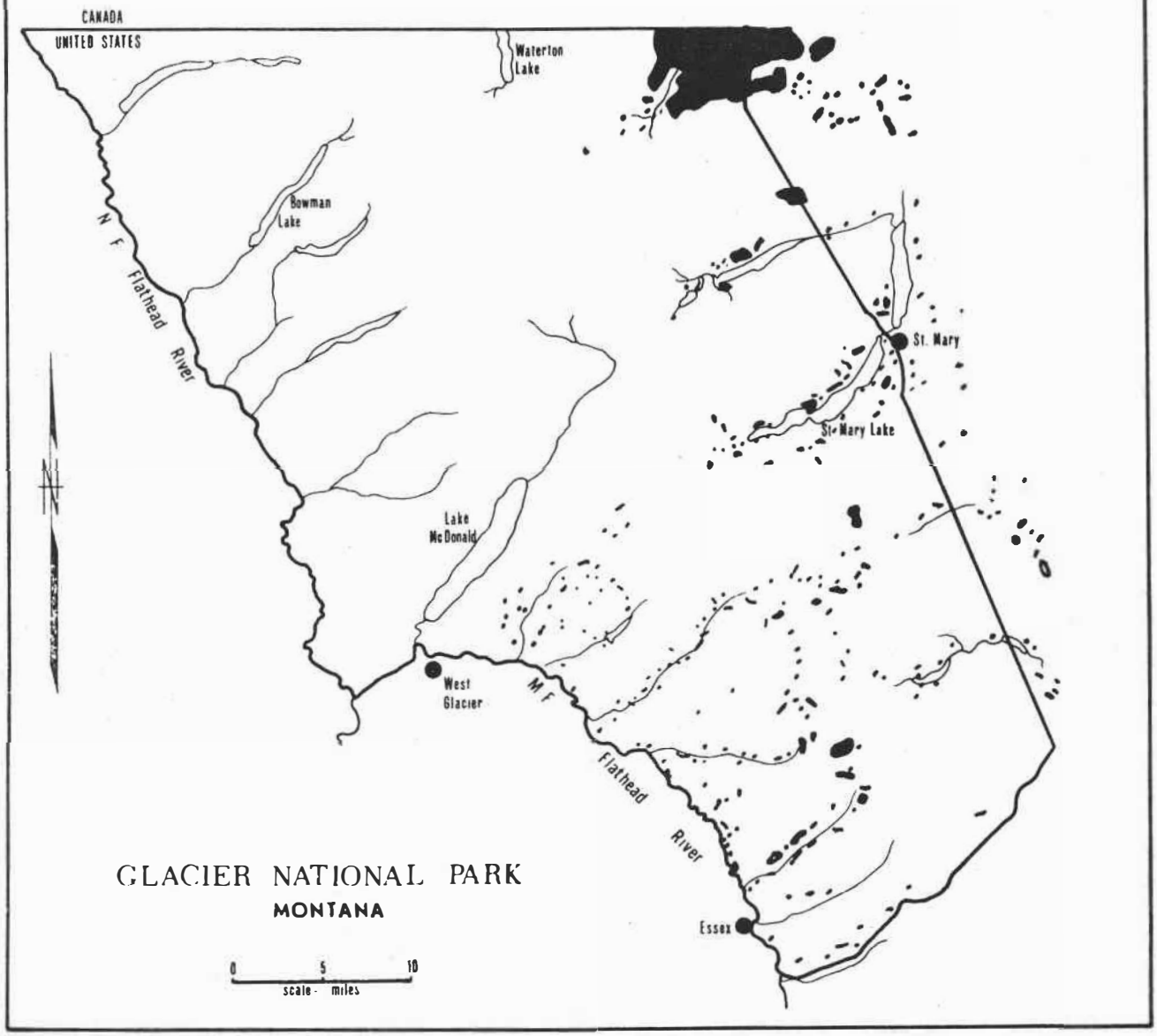


Figure 10.--Areas of lodgepole pine infested by the mountain pine beetle, Nezperce National Forest, 1985.

Figure 11.--Pine stands infested by the mountain pine beetle in Glacier National Park and on the Blackfeet Indian Reservation, Montana, 1985.



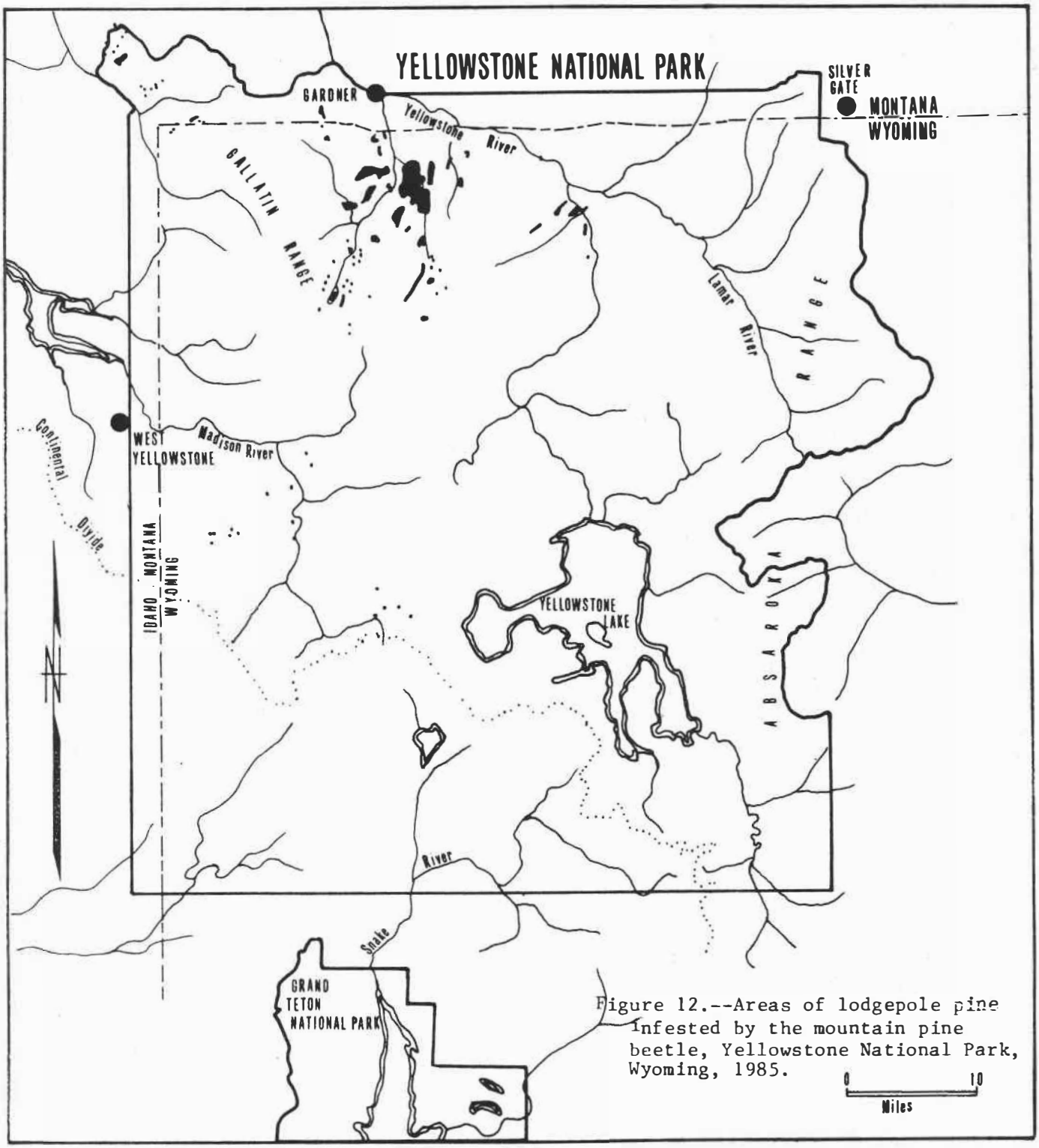


Figure 12.--Areas of lodgepole pine infested by the mountain pine beetle, Yellowstone National Park, Wyoming, 1985.

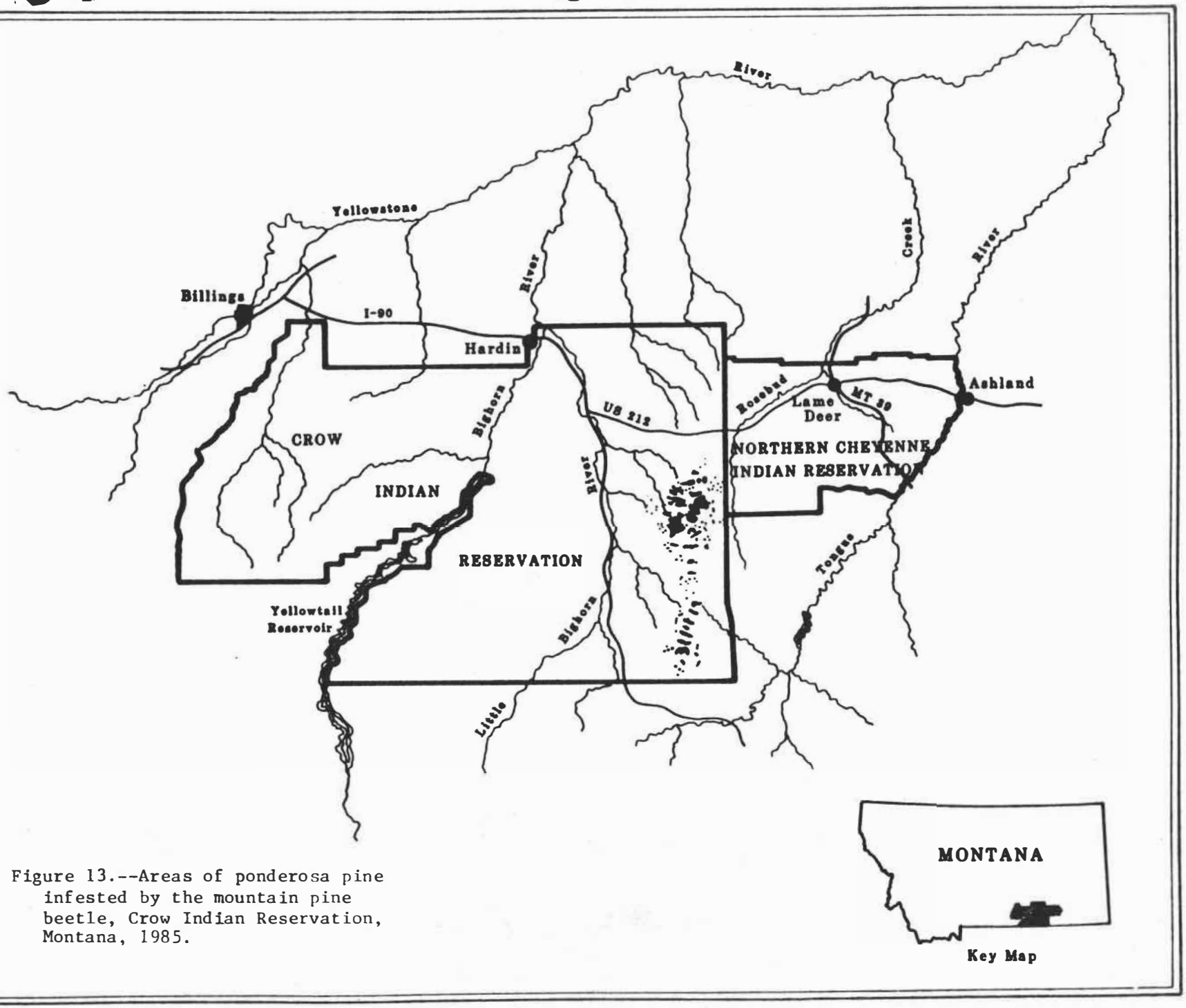


Figure 13.--Areas of ponderosa pine infested by the mountain pine beetle, Crow Indian Reservation, Montana, 1985.

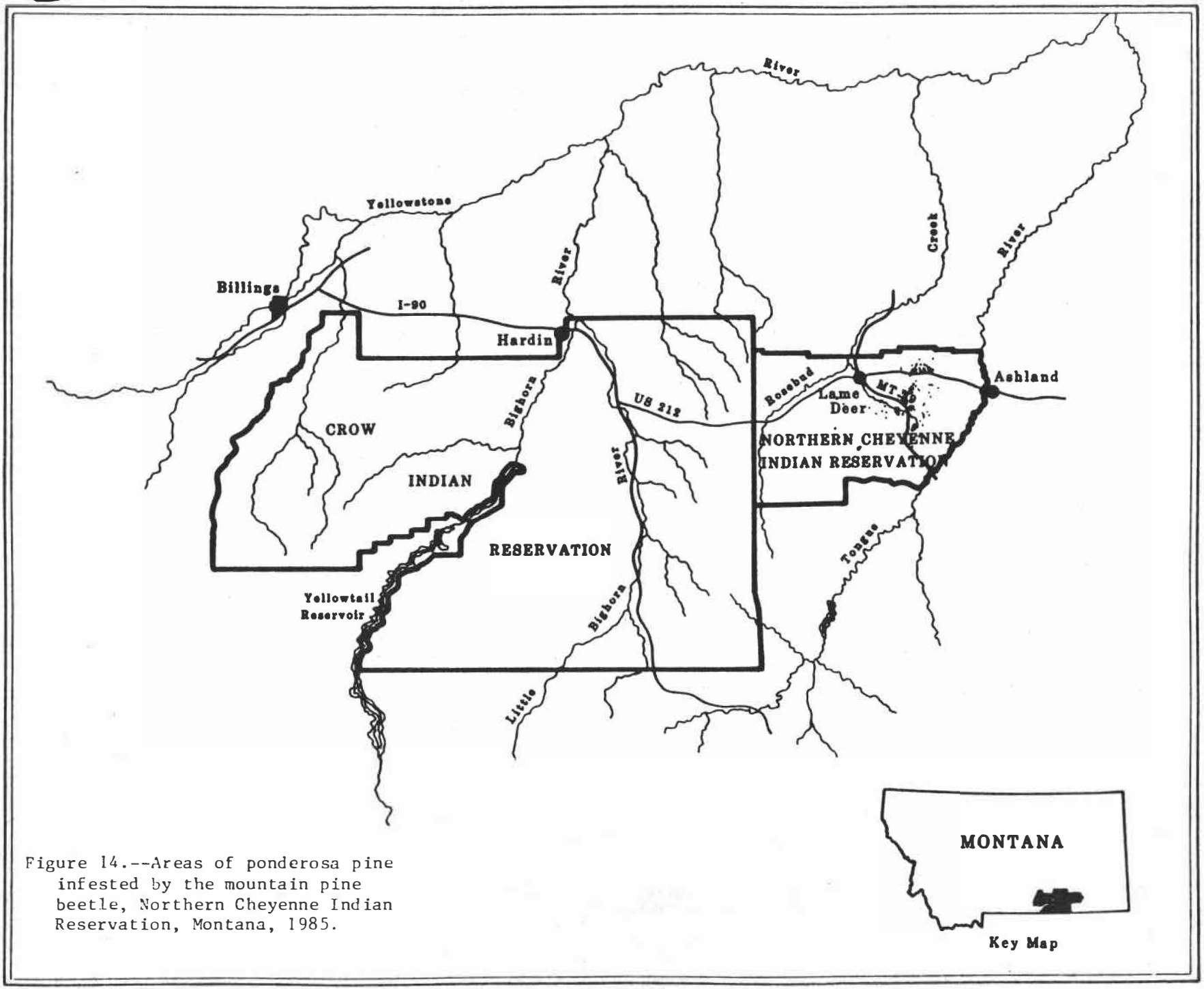


Figure 14.--Areas of ponderosa pine infested by the mountain pine beetle, Northern Cheyenne Indian Reservation, Montana, 1985.

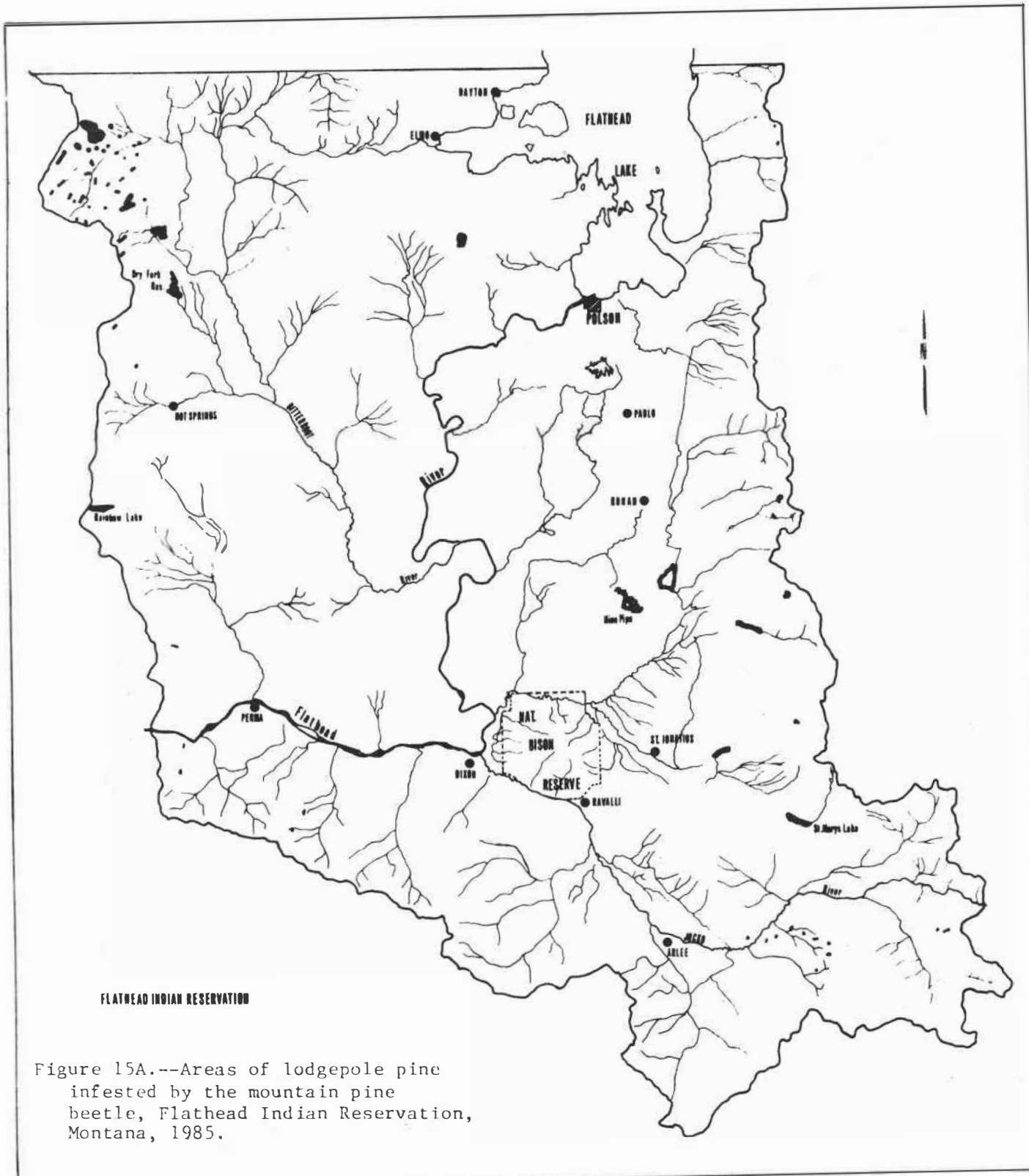


Figure 15A.--Areas of lodgepole pine infested by the mountain pine beetle, Flathead Indian Reservation, Montana, 1985.

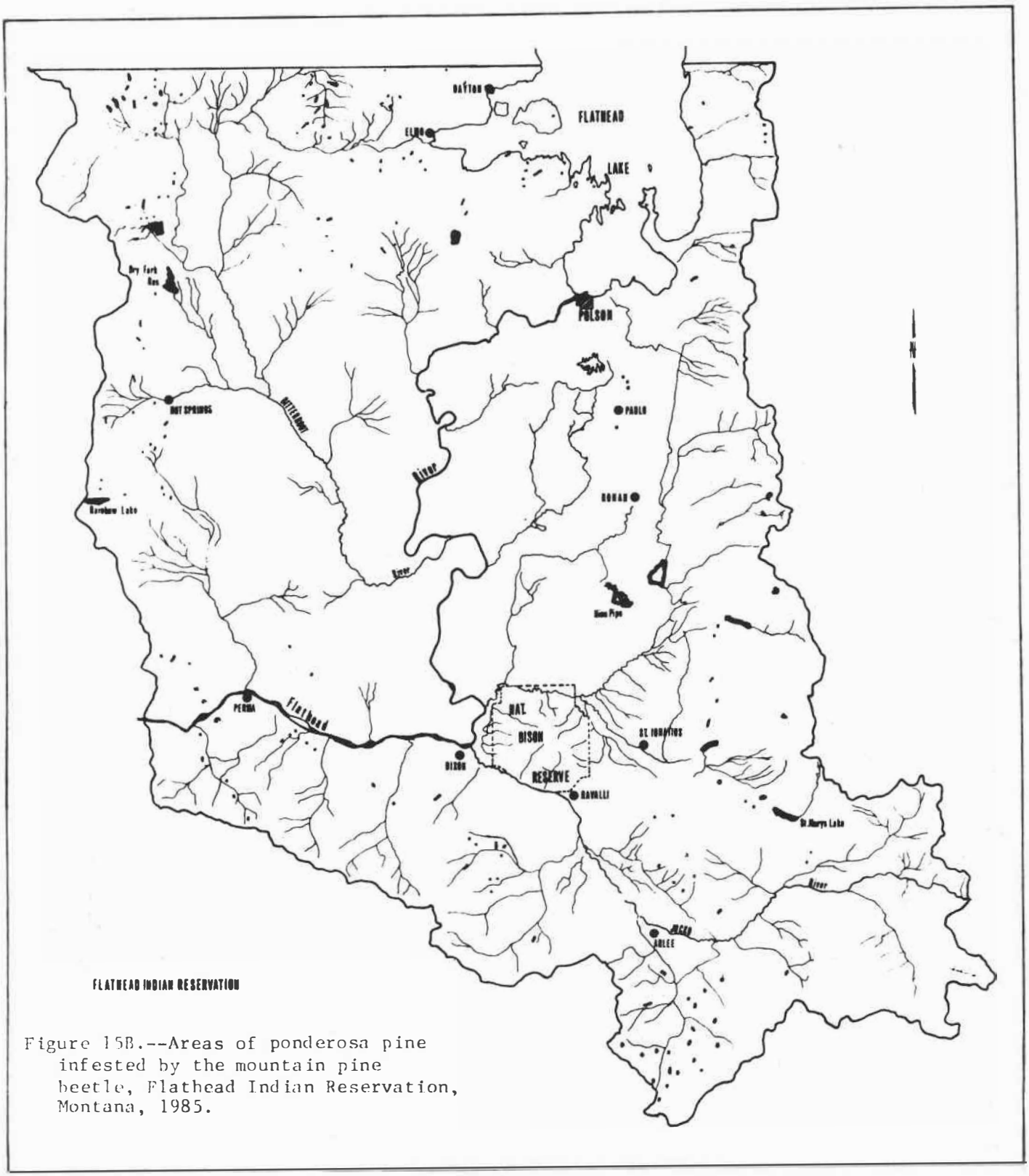


Figure 15B.--Areas of ponderosa pine infested by the mountain pine beetle, Flathead Indian Reservation, Montana, 1985.

Figure 16.--Areas of ponderosa pine infested by the mountain pine beetle on Fort Belknap Indian Reservation and Bureau of Land Management lands, Montana, 1985.